



eBook

Solving Edge Storage Challenges

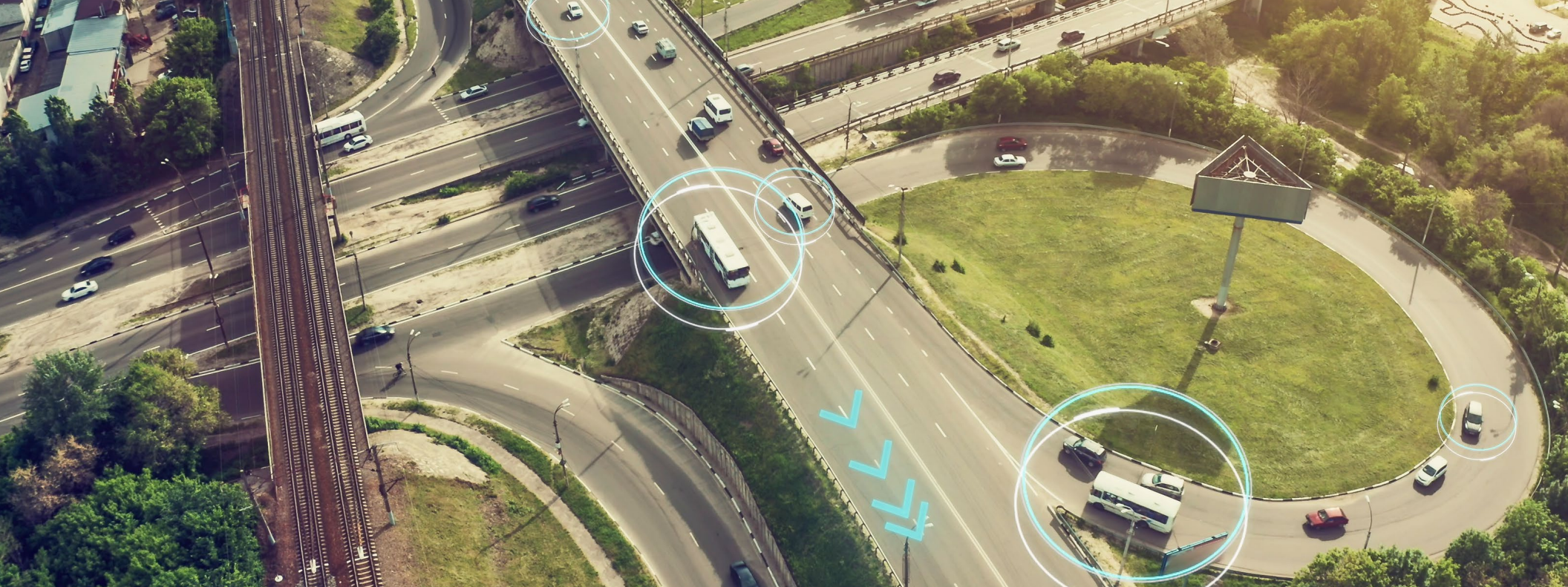
Aggregate, store, move, and activate your data the smart way.



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Edge devices are expected to generate 175 zettabytes of data by 2025, a tenfold increase from 2016 levels.¹

Collecting and storing large volumes of digital information in the field, adding to an organization's Big Data for analysis and action, has long required costly and unwieldy solutions. The challenge spans industries, from high-definition video in media and entertainment, scientific field research data, surveillance and bodycam video, autonomous vehicles, and even seismic data acquisition from ships at sea. And with the proliferation of IoT devices and sensors into ever remote environments, from deserts to the ocean, the challenge will continue to grow.

If you think of the cloud, a "core" where much computing and storage takes place today, as the hub of a wheel, these far-flung data-producing endpoints are at the very edge. Let's take a deeper dive into the challenges that organizations face in transferring data from the edge to the cloud, and how a modern Edge Storage and Data Transfer as a Service solution can overcome them.



Overcoming Data Sprawl

A massive proliferation of endpoints and IoT devices has added considerably to the tremendous wealth of valuable Big Data for organizations around the world to analyze and act upon. But it also increases the challenge of how to manage all this data, especially when it comes to large volumes generated in field environments that may be remote, harsh, and unserved by wireless or wired bandwidth/network pipeline.

There are several basic challenges that can make this process daunting.

- 1. Data sprawl.** Valuable data can be generated anywhere, even in remote and/or harsh environments poorly served by infrastructure, IT, or otherwise. This is a boon, of course: the more data, the better. But the sprawl creates multiple challenges to accessing that data, including “data gravity,” meaning that the bigger (“heavier”) individual data volumes get, the harder they are to quickly move where they’re needed.
- 2. Network limitations:** The most obvious solution for data transfer is via traditional wired or wireless bandwidth/network pipeline networks, yet many environments (mountaintops, deserts, and oceans) lack any connectivity. When a network is available, it may be slow, limited, shared by multiple parties, and unreliable—not to mention expensive.
- 3. Unsuitable hardware.** Traditional storage appliances are too large, too heavy, and often too fragile to work in harsh environments. Also, they typically lack the required capacity and performance required to transfer mass data quickly.
- 4. Vendor lock-in:** Some cloud storage vendors supply data transfer appliances to move large volumes of data, but in addition to the limitations above, these devices are often part of closed ecosystems that lock your data into a predetermined platform. What’s more, they may only enable unidirectional data flow or may retain data, begrudgingly from customers, as a result of high egress fees.
- 5. Security risks:** Physical devices and mobile networks alike can expose security vulnerabilities. Mobile networks may not comply with data security regulations and norms, while storage devices are susceptible to tampering.
- 6. High cost:** Purchasing typical data shuttle appliances outright means incurring a high initial capital expense and ongoing maintenance and upgrade costs, as well as managing asset disposal and end-of-life recycling fees. Going this route may require payment over a three- to five-year period, which could triple the cost of in-house management. These solutions have the added disadvantage of inflexibility, requiring the upfront purchase of maximum anticipated capacity, no matter how infrequently it’s required.



Moving Data from the Edge

While physical storage devices have a clear advantage over wireless networks for transferring large volumes of data from remote locations, that is just the first decision that CIOs and IT managers must make when weighing their Big Data storage options. If they choose a physical storage solution, they must also choose one that meets environmental, capacity, mobility, security, and financial requirements.

Choosing a subscription model for physical data transfer can help overcome some of these challenges with a streamlined, flexible, and cost-effective approach that yields clear benefits to CIOs and IT managers across multiple industries. These benefits include:

- Pay only for what you need, when you need it, with no vendor lock-in
- Frictionless data movement
- Streamlined field device management
- Faster IT equipment refresh and upgrade
- Elimination of large upfront costs
- A predictable OPEX right-sized for the need, whether a one-time lift-and-shift or a weekly data transfer
- No asset disposition or disposal fees
- Maintain a predictable, fixed monthly storage budget and avoid market price volatility

Lyve™ Mobile from Seagate® is purpose-built for the edge, offering enterprise-grade storage for any endpoint on demand. Our transparent subscription service allows you to optimize your data storage costs and manage your fleet of storage devices without worrying about hardware upgrades, maintenance, or device compatibility. You can scale your storage up or down with flexible, modular systems—and only pay for the devices you need when you need them. In addition, we offer a reserved inventory program for long-term subscriptions to mitigate supply constraints and limitations. Lyve Mobile is part of Seagate's Lyve edge-to-cloud mass storage platform.

With storage that's purpose-built for speed- and capacity-intensive workloads, you can overcome bandwidth limitations and security risks, while putting your data to work faster and eliminating network dependencies. And because our devices are vendor-agnostic, you can build or complement your cloud strategy without vendor lock-in.

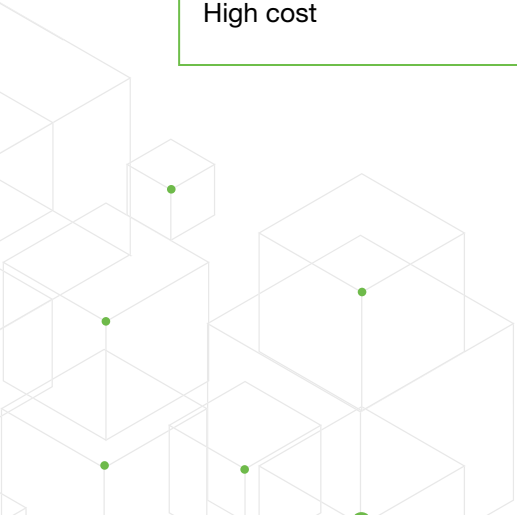




Let's look at how Lyve Mobile can benefit your organization in more detail.

Challenges	Lyve Mobile Services
Data sprawl (requiring endpoint data consolidation)	Human-portable mobile storage appliances handle high capacity and make it easy to consolidate data into mobile arrays
Network limitations	DAS (Direct-Attached Storage) or PCIe (Peripheral Component Interconnect Express) connectivity provide improved speed/performance
Unsuitable hardware	Secure, rugged, tamper-resistant, fully-enclosed devices
Vendor lock-in, one-directional data flow	Vendor-agnostic, bi-directional, multi-location, multi-user
Security risks	TCG enterprise encryption with off-appliance keys
High cost	Flexible subscription model

Address data sprawl with secure, high-capacity, truly portable-by-a-single-individual storage units that can collect data wherever it's generated and transport it easily and securely to where it's needed.





Use Case: Smart City Safety and Security

Smart cities leverage IoT and other types of data to improve safety and quality of life for their citizens, but they also have an obligation to be as cost-effective and efficient as possible. One municipality deployed cameras in multiple locations, allowing for real-time monitoring and safety response. In addition, the cameras were grouped by city section where local storage sites collected raw video via Ethernet or Wi-Fi. This data, amounting to 108PB per month, is transferred by Lyve Mobile appliances to a central data lake. From there, it may be further transported into a high-performance computing environment for advanced analysis or train automated detection models for license plate and facial recognition, traffic flow, and other purposes.

Overcome network limitations with a solution that provides greater speed, reliability, and capacity than network transmission.

Prevent data sprawl by consolidating data from multiple locations, aggregating it, and shuttling it to a central repository (i.e., data lake).

Enhance data transfer performance: Some organizations' data creates a large total volume but is comprised of multiple small files. Many devices, including NAS (network-attached storage) and other network types, have bandwidth issues and have difficulty handling millions of small files. In these instances, transfer time can be slower than physical data transfer, especially as files get transmitted individually.

Ensure security: Physical data transfer can aid in the adherence of data compliance/regulations, especially when dealing with highly sensitive personal data such as license plates, facial recognition, etc. Users can maintain security and compliance with off-appliance encryption keys, user monitoring, data tracking, and compliance with programs such as HIPAA, SOC2, or FedRamp.





Use case: A Mt. Everest documentary production

Consider the difficulty of an eight-to-12-week film shoot requiring 500TB of data with triple redundancy for a total of 1.5PB of data. With Lyve Mobile solutions, the production team can procure the necessary equipment on a monthly basis. Lyve Mobile shuttles and arrays let the team review and edit footage on location, then transport it safely across harsh landscapes for uploading. Once the shoot is complete, the production company simply returns the equipment.

Prevent data loss and damaged devices with optional ruggedized cases that protect data from unpredictable edge environments and rough transit. Also, if a network connection goes down, having a physical shuttle appliance continuously recording will help prevent data loss in the event of network downtime.

Make data transfer easier with physical storage devices that provide simple connectivity and customer choice in file management. Concerns with performance and speed are addressed, as is exposure within rugged environments. Capacity within a small footprint is just as important, as the less devices to carry up a mountainside, the better.

Avoid vendor lock-in with a vendor-agnostic system that includes universal file protocol support, works with multiple OS environments, and connects easily in the data center via a Thunderbolt or USB port.





Use Case: Genomic Research

The need for high-volume data sets of 50TB per day, security, and public cloud ingress and egress fees are pushing genomics research to move data physically. For example, one independent lab specializing in scRNA imaging collects and delivers data using Lyve Mobile Array. Data delivered is ingested, put through a quality assurance process, and then ingested again into a primary data store where R&D can analyze what genes are being expressed at the cell level across different conditions.

Lower your costs and improve cash flow with a cost-efficient subscription model that transitions away from high-capital outlays (CAPEX) to a flexible and scalable operational expense (OPEX) that can adjust up or down to accommodate changing storage needs. Such a solution provides flexibility for projects on a budget, where users pay only for what's needed, as well as lowers IT entry costs with a predictable monthly fee.

Achieve timely industry compliance: The healthcare industry is one of the most targeted for data breaches. Off-appliance encryption keys, user monitoring, data tracking, and HIPAA/SOC2/FedRamp compliance make a physical data transfer subscription an easy choice. Simultaneously, the proliferation of clinical data emphasizes users' expected speed of data access and analytical insight. Users can compare moving large amounts of edge-generated data via their wired/wireless broadband network's bandwidth with using data shuttles featuring DAS or PCIe connectivity.





Use Case: Reality Television

A television series generates roughly 14TB of digitally recorded content every week, ranging in resolution from 2K to 5K using multi-camera shots. This adds up to 2.2PB per 22-episode season. With the shift to virtual production, data redundancy is threefold, tripling the amount of content that needs to be moved physically to offset locations. The Lyve Mobile subscription model allows the production team to use the capacity it needs, when it needs it, without incurring huge CAPEX outlays or equipment maintenance expenses.

LYVE™ Mobile



Creating New Possibilities

The volumes of Big Data collected by organizations and businesses will continue increasing exponentially. This fact doesn't have to become more challenging. Whether you're collecting, moving, and storing data from a film set, a remote oil field, a mountain peak, or a moving vehicle, there's an easier, faster, more secure, and more cost-effective way to manage it.

Lyve Mobile offers a new paradigm for fast, secure, reliable, and flexible high-volume edge data storage. CAPEX outlays are a thing of the past. You can get the top-of-the-line storage you need, when you need it, and then scale down when projects end.

Lyve Mobile solutions simplify the data collection and storage process, from remote endpoints to the metro and macro edges to the cloud core, with a flexible and scalable Edge Storage and Data Transfer as a Service subscription model.

[Learn more about Edge Storage and Data Transfer as a Service.](#)



LYVE™ Cloud

Frictionless Cloud Storage as a Service

Lyve Cloud from Seagate is simple, trusted, and efficient S3 object storage as a service, available at the metro edge. As part of the Lyve edge-to-cloud mass storage platform, Lyve Cloud complements Lyve Mobile with long-term cost predictability. Always-on availability, world-class security, and cloud flexibility allow for full utilization of your valuable data. Lyve Cloud, whether alone or part of a multicloud strategy, delivers optimal TCO for mass data storage.

[Learn more about Seagate Lyve Cloud S3 Storage as a Service.](#)

References

1 Seagate, "Data at the Edge: Managing and Activating Information in a Distributed World," 2019

Further Reading

- Seagate Lyve Mobile - Data Transfer as a Service: <https://www.seagate.com/services/data/data-transfer/>
- Edge Storage Solutions: <https://www.seagate.com/solutions/edge/edge-storage/>

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